

CLAIMS:

1. Apparatus for cleaning a plurality of electronic components, comprising:
 - 5 a tank for containing a cleaning fluid;
an ultrasonic resonator mountable in communication with the cleaning fluid for charging ultrasonic energy thereto;
a support platform positionable over a top surface of the cleaning fluid for supporting the electronic components such that the electronic components
 - 10 are in contact with said top surface of the cleaning fluid in use; and
a cleaning fluid supply system for generating a continuous flow of cleaning fluid into the tank for cleaning the electronic components in contact with said top surface of the cleaning fluid.
- 15 2. Apparatus as claimed in claim 1, wherein the ultrasonic resonator is immersed into the cleaning fluid inside the tank.
3. Apparatus as claimed in claim 1, wherein the ultrasonic resonator is mounted to an external surface of the tank.
- 20 4. Apparatus as claimed in claim 1, wherein the continuous flow of cleaning fluid generated by the cleaning fluid supply system maintains the top surface of the cleaning fluid at a level higher than a rim of the tank, whereby cleaning fluid continuously overflows out of the tank.
- 25 5. Apparatus as claimed in claim 4, including an outer tank arranged adjacent to the tank, which is configured to collect cleaning fluid overflowing from the tank.
- 30 6. Apparatus as claimed in claim 1, wherein the electronic components are supported on a surface of the support platform that is opposite to a surface facing the top surface of the cleaning fluid.

7. Apparatus as claimed in claim 6, wherein the support platform is mounted onto a rim of the tank.

5 8. Apparatus as claimed in claim 7, including fluid inlets in the support platform that are in communication with the cleaning fluid for diffusing cleaning fluid to the surface of the support platform on which the electronic components are supported.

10 9. Apparatus as claimed in claim 8, including fluid outlets in the support platform for draining cleaning fluid away from the surface of the support platform on which the electronic components are supported.

15 10. Apparatus as claimed in claim 8, wherein the cleaning fluid supply system is adapted to supply an adequate flow of cleaning fluid to the tank such as to maintain a substantially uniform amount of cleaning fluid in contact with the electronic components on the surface of the support platform.

20 11. Apparatus as claimed in claim 6, including a transferring device operative to position the electronic components onto the surface of the support platform.

25 12. Apparatus as claimed in claim 11, including a moving mechanism for repeatedly moving the electronic components laterally relative to the top surface of the cleaning fluid that is in contact with the electronic components.

13. Apparatus as claimed in claim 1, wherein the electronic components are supported on a surface of the support platform facing the top surface of the cleaning fluid.

30 14. Apparatus as claimed in claim 13, including a vacuum suction device for holding the electronic components onto the surface of the support platform facing the top surface of the cleaning fluid.

15. Apparatus as claimed in claim 13, including a layer of cleaning fluid spray formed at the top surface of the cleaning fluid, whereby to contact the electronic components.
- 5 16. Apparatus as claimed in claim 1, wherein the frequency of ultrasonic energy supplied by the ultrasonic transducer is 20 to 80 kHz.
17. Apparatus as claimed in claim 1, wherein the tank is made from stainless steel or other stable metal.
- 10 18. Apparatus as claimed in claim 1, wherein the platform is made of aluminium with hard anodizing or stainless steel or other stable metal.
19. Method for cleaning a plurality of electronic components, comprising
15 the steps of:
 providing a tank containing a cleaning fluid;
 ultrasonically charging the cleaning fluid;
 supporting the electronic components such that the electronic components are in contact with a top surface of the cleaning fluid; and
20 generating a continuous flow of cleaning fluid into the tank for cleaning the electronic components in contact with said top surface of the cleaning fluid.
20. Method as claimed in claim 19, including immersing an ultrasonic
25 resonator into the cleaning fluid inside the tank for ultrasonically charging the cleaning fluid.
21. Method as claimed in claim 19, including mounting an ultrasonic resonator on an external surface of the tank for ultrasonically charging the
30 cleaning fluid.
22. Method as claimed in claim 19, wherein the step of generating a continuous flow of cleaning fluid into the tank includes maintaining the top

surface of the cleaning fluid at a level higher than the rim of the tank, whereby cleaning fluid overflows out of the tank.

23. Method as claimed in claim 22, including collecting cleaning fluid
5 overflowing from the tank with another tank for drainage.

24. Method as claimed in claim 19, wherein the electronic components are
supported on a surface of a support platform that is opposite to a surface
facing the top surface of the cleaning fluid.
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25. Method as claimed in claim 24, wherein the support platform is
mounted onto a rim of the tank.

26. Method as claimed in claim 24, including diffusing cleaning fluid from
15 the tank to the surface of the support platform on which the electronic
components are supported.

27. Method as claimed in claim 26, including draining cleaning fluid away
from the surface of the support platform on which the electronic components
20 are supported.

28. Method as claimed in claim 26, including the step of maintaining a
substantially uniform amount of cleaning fluid in contact with the electronic
components on the surface of the support platform by providing an adequate
25 supply of cleaning fluid to the tank.

29. Method as claimed in claim 24, including repeatedly moving the
electronic components laterally relative to the top surface of the cleaning fluid
that is in contact with the electronic components.
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30. Method as claimed in claim 19, wherein the electronic components are
supported on a surface of a support platform facing the top surface of the
cleaning fluid.

31. Method as claimed in claim 30, including using vacuum suction to hold the electronic components to the surface of the support platform facing the top surface of the cleaning fluid.
- 5 32. Method as claimed in claim 30, including forming a layer of cleaning fluid spray at the top surface of the cleaning fluid, whereby to contact the electronic components.
- 10 33. Method as claimed in claim 19, wherein the frequency of ultrasonic energy charged to the cleaning fluid is 20 to 80 kHz.